

Town of

EASTHAM, MA



Wastewater Management Planning Project

EASTHAM MOVES FORWARD WITH WASTEWATER PLANNING

At the May 2008 Town Meeting, a detailed study to address the wastewater issues facing Eastham was approved and funded. This study was designed to focus on the following key questions

Should drinking water quality problems be addressed by treating wastewater or providing public water from a protected source?

How can the nitrogen loads to the Nauset/Town Cove and Rock Harbor Estuaries be reduced as specified by the Massachusetts DEP?

How can the water quality of the ponds be improved?

Efforts by the Town's consultant, Stearns & Wheeler-GHD, to address these issues culminated in the Final Report entitled "Wastewater Plan Evaluation Report" dated May 2009 which is available at Town Hall and the Town's website: www.eastham-ma.gov.

The main findings and recommendations of that report are summarized in this newsletter.



WATER AND WASTEWATER ISSUES IN EASTHAM

Two key factors summarize the Town's wastewater challenges:

1. Human Health Needs. Nearly all of the properties in Town are served by individual water supply wells and individual septic systems on the same lot. These private wells are becoming impacted by septic tank effluent and other land use activities (car washing, automotive storage, fertilizer application, pesticide use, etc.). The contamination is indicated by elevated nitrate levels detected in the wells. The nitrate levels that we are seeing in Eastham are not (by themselves) a serious human health threat to most of the population; but these levels do indicate the high probability that there is other contamination (viruses, volatile organic compounds, pharmaceuticals, phosphorus, etc.) in the drinking water. The probability that these contaminants are present in private wells does pose a potential health risk.

2. Environmental Health Needs. The groundwater system with its elevated nitrogen and phosphorus levels recharges into several coastal estuaries and freshwater ponds. The nitrogen acts as a fertilizer (nutrient) in the estuaries, as does phosphorus in the ponds. This "over fertilization" stimulates the growth of algae which, in turn, causes several water quality problems in these surface waters such as: loss of water clarity, excessive algal growth, loss of animal habitat and production of odors. State, Federal, and regional agencies are now setting nutrient limits (Total Maximum Daily Loads, also called TMDLs) on the amounts of nitrogen and phosphorus that are allowed to enter estuaries or ponds.

The watersheds of the Town's main surface waters are shown in Figure 1. Septic system discharges into the watersheds are the main sources of nitrogen and phosphorus to these water bodies. Evaluations indicate that the restoration and

management of long-term water quality will require the removal of 55 percent of the current wastewater nitrogen discharges from the Nauset/Town Cove Estuary Watershed; 79 percent of such discharges from the Rock Harbor Estuary Watershed; and 100 percent of the current wastewater phosphorus discharges from the Freshwater Pond System Watershed. These are big reductions.

ALTERNATIVE SOLUTIONS EVALUATED

All feasible technologies and management concepts were considered as possible ways to address the human health and environmental health needs, including: composting toilets, improved septic systems, community/cluster wastewater systems, alum treatment of the ponds, and individual treatment of private water supply wells. This work was completed in March 2009 and the evaluations were summarized in the Interim Needs Assessment and Alternatives Screening Analysis Report (also available at Town Hall and on the Town's website). These evaluations then selected the most feasible alternative solutions and formulated the group of Alternative Management Plans that were subsequently evaluated in the Plan Evaluation Report.

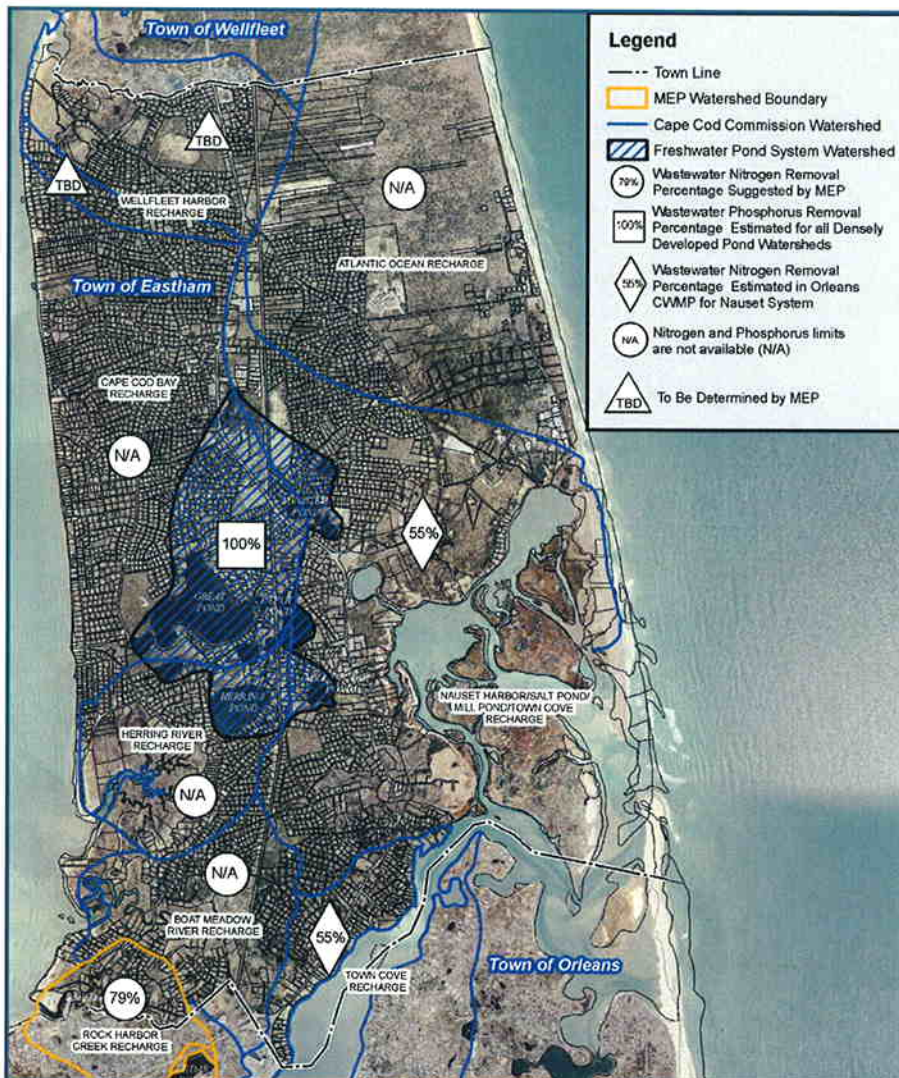


Figure 1. Watershed delineations and estimated wastewater nutrient reductions needed to address expected TMDLs.

ALTERNATIVE SOLUTIONS EVALUATED (CONT).

To address the **Human Health Needs**, the Town is currently evaluating the drinking water supply potential of two sources – new wells located in Eastham and the existing water system of the Town of Orleans. To ensure that the public's human health needs are met, drinking water has to be provided from a protected supply source. Time and cost factors indicate that wastewater treatment by itself is inadequate to address the human health concerns. It would take 30 to 50 years to see the beneficial effect of wastewater treatment on the well water quality; and the cost for a town-wide sewer and treatment system is estimated to be 4 to 5 times higher than that of Public Water Supply from a protected source.

To address the **Environmental Health Needs**, three alternative wastewater management plans were evaluated for each of the three watersheds. Considered were: 1) individual septic systems for nitrogen removal, 2) community/cluster wastewater systems for selected portions of the watershed, and 3) a more centralized sewer system leading to one wastewater treatment plant serving the selected portions of the watersheds. The study evaluated several possible wastewater treatment sites and revealed the Tri-Town septage Facility in Orleans to be the most suitable location. The study determined a joint sewer system with the Town of Orleans is the best option for the Nauset/Town Cove Estuary Watershed and, possibly, for the Rock Harbor Watershed. (Additional nitrogen work is still needed for Rock Harbor.) Alum treatment of the ponds is the lowest cost and most effective way to address phosphorous loadings to the ponds.

COST ESTIMATES FOR THE PLANS

An important conclusion of this planning project is that Town-wide wastewater treatment is not needed. The Town's environmental health needs can be met by partial sewerage of selected watersheds.

The Public Water Supply System for the whole Town is estimated to have a capital cost of \$80 million.

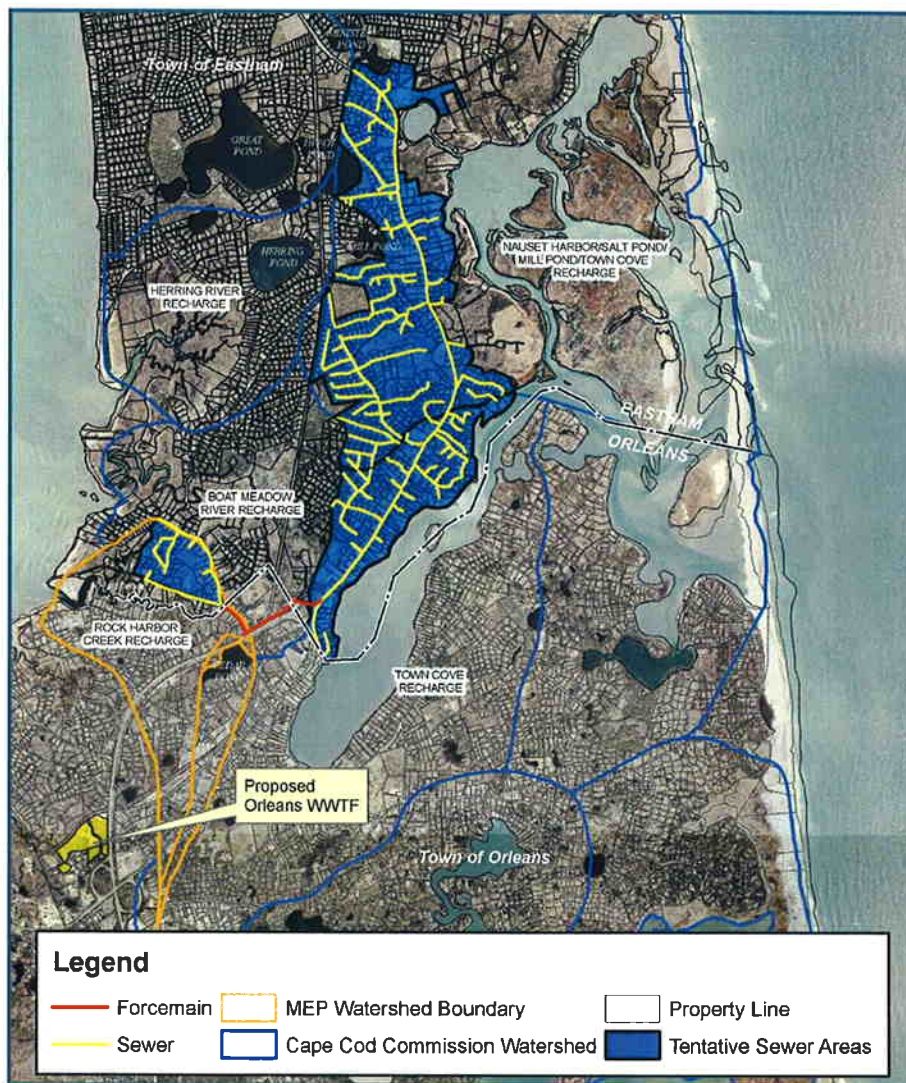


Figure 2. Tentative sewer areas needed to address expected nitrogen TMDLs.

Costs for a Wastewater Management System to address the environmental health needs are as follows.

- The sewer installations for the portions of the Nauset/Town Cove Estuary and Rock Harbor Estuary Watersheds (see Figure 2) have an estimated capital cost of \$60 million.
- If all the ponds in the freshwater pond system watershed were to be treated at one time, the cost would be approximately \$1 million. But this type of treatment is typically applied over a long period of time, and some of the ponds may not need extensive management.
- Annual costs to individual property owners will need to be estimated once funding and cost distribution decisions have been developed by the Town.
- Typically, the capital costs for these systems are not paid solely by the properties in the watersheds or their sewer sections, but are shared by the whole Town.

RECOMMENDED NEXT STEPS

The Town is proceeding quickly with the **Drinking Water Supply** planning and implementation activities because the human health need is so clear. There is more time to **plan** and budget for the recommended approaches to meet the environmental health needs.

Based on the main findings of this planning project, the following next steps are recommended to address the human health and environmental health wastewater needs.

- Continue to coordinate with the Town of Orleans as they complete their Wastewater Regionalization Study.
- Continue to coordinate with MassDEP as they finalize the nitrogen limits for Nauset/Town Cove Estuary and Rock Harbor Estuary, and determine their willingness to consider alternative methods to meet the limit for Rock Harbor.

